



Occupational Health Surveillance Update

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Fatal Falls in the New Jersey Construction Industry What Have We Learned?

A 32-year old ironworker was working on a warehouse roof installing metal roof decking. There were very high, blustery winds. He was standing between roof beams and joists. The worker held onto a secured steel girder for support while he leaned forward to grab hold of sheeting materials from a crane operator. He lost his footing and fell 30 to 40 feet to the ground below. His fall could have been prevented had he been wearing fall protection equipment.

This is one of 129 work-related fatalities that occurred in New Jersey in 2001. All work-related fatalities are identified through the Census of Fatal Occupational Injuries (CFOI) Program, a statistical program administered by the Federal Bureau of Labor Statistics (BLS) in cooperation with the New Jersey Department of Health & Senior Services. The purpose of CFOI is to produce a



A roofer shown working near the edge of a roof, but not wearing fall protection equipment.

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The Anthrax Attack — The Surveillance Program Responds

In early October of 2001, an alert infectious disease physician recognized a possible case of inhalational anthrax in a man hospitalized in Florida. Within a week, the man had died and there were seven people in the northeastern US with cutaneous anthrax. At that time, no one could have predicted the scope and magnitude of the public health response that would ultimately ensue. An investigation by public health officials, the Federal Bureau of Investigation (FBI), and the United States Postal Service (USPS) found that four letters,

each containing billions of spores of deadly *Bacillus anthracis*, were processed by the USPS Trenton Processing and Distribution Center (PDC) in Hamilton Township, New Jersey. When a worker from the Trenton PDC was diagnosed with cutaneous anthrax, the facility was immediately closed. The New Jersey Department of Health and Senior Services (DHSS) then became involved in a long and intense multi-

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Preventing Occupational Disease and Injury in New Jersey — The Role of the Clinician

The prevention of work-related illness and injury in the State is an important component of the overall public health strategy of the New Jersey Department of Health and Senior Services (DHSS). Prevention of occupational health illness and injury is accomplished through the reduction or elimination of hazards, as well as through early detection and reporting of disease. A key activity in attaining this goal is surveillance. In public health, surveillance programs are designed to collect, analyze, and disseminate information that leads to preventive

action. This information is essential to the DHSS's efforts to direct scarce resources to effective intervention programs that will prevent illness and injury in New Jersey workplaces. Currently, the Department's intervention activities include the evaluation of workplace hazards such as lead, workplace asthmagens, silica, and others; partnerships with other stakeholders to develop prevention strategies; providing information, training, and technical assistance to workers, employers, and health care providers; and tracking patterns of

work-related injury and illness in New Jersey.

The surveillance of occupational illnesses, injuries, and hazards is carried out in the DHSS by an interdisciplinary team of industrial hygienists, epidemiologists, physicians, and other public health professionals. This team provides a unique opportunity to directly link data collection and analysis with intervention. Surveillance efforts have been supported by both State funds designated for surveillance and by grants from the federal Centers for Disease Control and Prevention - National Institute for Occupational Safety and Health (CDC/NIOSH), the U.S. Department of Labor – Bureau of Labor Statistics, and the National Cancer Institute.

Surveillance or tracking occupational injury and illness begins with the collection of data: routinely collected data such as hospital discharge and workers' compensation data; and reporting of certain occupational diseases and poisonings by physicians and clinical laboratories as mandated by State rules N.J.A.C. 8:57-3.2 and N.J.A.C. 8:44-2.11, respectively. The importance of physician-based reporting is underscored by a young worker who died of a fatal asthma attack even though his physician knew that his illness was work-related (see sidebar).

Physicians are an important and knowledgeable source of information about illness and injury. Many surveillance data sources

Lesson Learned?

When Adam (not his real name) left for work one Spring morning, his mother said goodbye, not knowing that it would be the last time she ever saw him alive. Adam worked as a forklift operator/material handler at a company that a few years earlier recognized that there was a market for powdered shark cartilage, which was a popular homeopathic remedy for a number of ailments, including arthritis, cancer, and, ironically, asthma. Due to the nature of the processing operations, milling systems, and work practices employed by mill operators, a great deal of dust was generated in the vicinity of the shark cartilage milling systems.

Adam's job required that he work in the vicinity of the shark cartilage mills and handle large volumes of powdered material. He recognized early that exposure to shark cartilage dust caused problems with his breathing, and had sought medical attention for these problems a year and a half earlier. Over the course of the next 17 months, Adam visited the company's doctor seven times complaining of symptoms of asthma, where records show that he was warned five times not to work in the vicinity of shark cartilage. He also visited his personal physician several times with similar complaints, and was provided asthma medications. During this time, he also went to the local hospital's emergency department three times complaining of symptoms associated with asthma that he attributed to exposure to shark cartilage dust. One week after his last visit to the emergency department, Adam reported to his supervisor that he was short of breath and didn't feel well. As he prepared to go home, he collapsed in the company men's room and never regained consciousness. An autopsy showed that the cause of Adam's death was the result of an "acute asthma attack."

Adam was but one of an estimated 15% of adults with asthma whose symptoms are caused or aggravated by conditions at work. Tracking systems are in place for identifying sentinel cases of work-related asthma so that interventions can be conducted. In New Jersey, this system relies heavily on physician reporting to a state-based surveillance system in order to identify and prevent additional cases of work-related asthma in the State.

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Teenage Restaurant Workers Die on the Job

Every year, about 70 teenagers die from occupational injuries in the United States, and about 77,000 suffer from work injuries that result in visits to a hospital emergency department. The Centers for Disease Control and Prevention estimate that nearly 230,000 teens suffer work-related injuries each year. The New Jersey Department of Health and Senior Services FACE (Fatality Assessment and Control Evaluation) Program has recently investigated two fatalities involving teens who worked at pizza restaurants in New Jersey (see below).

In 2002, a 17-year-old pizza delivery driver was killed in a motor vehicle accident while on a delivery run. The victim was working his first night at a small suburban pizza restaurant. He was making his second delivery of the evening, driving his family's car to deliver a pizza to a home about a mile from the pizzeria. It was raining as he drove through a 30-mph "S" turn in the road. He lost control of his vehicle and spun out, hitting a tree alongside the road. He died later that evening after undergoing surgery at the local trauma center.

In 2001, a 16-year-old male pizzeria worker died when he was pulled into a pizza dough-mixing machine. The victim had been working at the family-owned pizza restaurant for two weeks doing odd jobs, mostly sweeping and cleaning. He was cleaning an electric dough-mixing machine as the restaurant was closing for the night. He was alone in the kitchen as the other staff cleaned the front dining room. He started the machine and reached into the 32-inch-diameter mixing bowl to clean it and was caught on a large, rotating mixing fork. His co-workers heard him scream for help, but could not reach him in time.



These incidents were preventable! Under Federal labor laws, youths under 18 years of age are prohibited from the following Hazardous Occupations (HO's): a) driving a motor vehicle - HO #2, and b) operating power-driven bakery machines, such as a dough mixer - HO #11.

Employers, workers, and parents should know both Federal and State child labor regulations. The following Internet resources will help employers, workers, and parents:

US Department of Labor, Wage & Hour Division

Telephone: 1-886-487-9243

Web site: www.dol.gov/elaws/esa/flsa/default.htm

New Jersey Department of Labor, Division of Wage & Hour Compliance

Telephone: (609) 292-2337

Web site: www.state.nj.us/labor/lssc/lscchild.html

Federal Occupational Safety & Health Administration (OSHA)

Web site: www.osha.gov/SLTC/teenworkers/index.html

National Institute for Occupational Safety & Health (NIOSH)

Web site: www.cdc.gov/niosh/adolespg.html

Occupational Health Surveillance Update

A newsletter of the Occupational Health Surveillance Program, Occupational Health Service (OHS), Division of Epidemiology, Environmental and Occupational Health, New Jersey Department of Health and Senior Services.

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Tree Trimming, A Dangerous Profession

Tree trimming is a hazardous activity and profession. From 1991 through 2001, 25 workers who were employed by arborists or landscapers died as a result of injuries they received during tree-trimming operations in New Jersey. Nationwide, approximately 353 arborists and 126 landscapers died in the years 1996 to 2001.¹ Many more workers sustained non-fatal injuries, some serious with life-long complications. Workers doing this work while employed by other industries (for example, maintenance workers) are also in danger of injury or death, if they have not been adequately trained.

The New Jersey Fatality Assessment and Control Evaluation (FACE) project maintains a surveillance system of fatal occupational injuries in the state and conducts on-site investigations of specific types of fatal injuries for research and educational purposes. Of the 25 fatal injuries that occurred during tree-trimming, 52% resulted from falls, 24% from contact with

electric current, and 24% by being struck by falling objects, usually tree branches (Figure 1).

The workers' ages ranged from 19 to 64 years, with an average age of 37. All of the decedents were male and were employed by private companies. Twenty-three of the 25 victims owned, or were employed by, tree-trimming companies, and two by landscapers. Each company had ten or fewer employees and was located in New Jersey.

The following are examples of the types of incidents in which the workers were fatally injured.

FALLS

In three incidents, the tree fractured when it was cut and the worker fell with the falling section. Equipment failures were noted in three incidents: two workers fell when their aerial lift failed; climbing equipment failed in one incident. To avoid tragedies such as these, a knowledgeable arborist should inspect the tree and its environment

when planning the job. If the tree is unsafe to climb, alternate procedures and equipment should be utilized. Prior to going on-site, all equipment, including climbing gear, should be inspected to ensure it is in safe working condition.

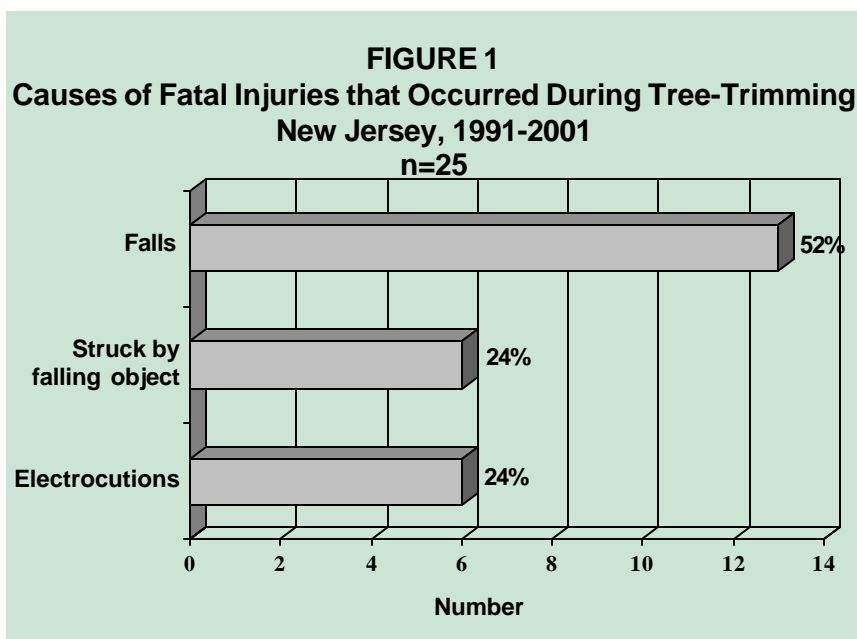
Incident A tree trimmer straddled a tree limb he planned to cut. His lanyard anchored him to the limb. His lifeline was secured to the tree, at a point either below the branch on which he was working, or level with his work area. When he cut the limb with his chain saw, the limb fractured between the trunk and the place on which he was positioned. He fell freely for 20 feet, attached to the branch by his lanyard, until his lifeline became taut and broke. He then fell another 40 feet and landed on a driveway.

Incident A tree trimmer climbed a tree and swung over to an adjacent rotted tree to remove it. He was tied to the rotted tree by his lanyard. The top of the tree fell away as he cut it. At the same time, the trunk of the rotted tree fractured below the point at which he was tied. He landed on the ground and was crushed by the broken tree trunk.

ELECTROCUTIONS

In order to be qualified to trim or remove trees that grow in proximity to overhead power lines, an arborist must be a certified line-clearance arborist and use appropriate equipment and safeguards. Other arborists can request that power companies de-energize the power lines prior to work being done. None of the workers who were electrocuted were line-clearance arborists.

Incident A tree trimmer and his assistant, a groundman, were



assigned to trim a tree that grew with power lines through the branches. They worked during a rainstorm. The tree trimmer wore his climbing gear, hearing protection, and a rain jacket. He used his chain saw to trim branches in the tree and was electrocuted when his hands made contact with the electrical lines in the wet tree.

Incident *A tree trimmer contacted a 7,600-volt overhead power line while clearing a loose branch from a tree. He rode the ball of a crane to reach the area and contacted the power line when he was swung toward the tree branch.*

STRUCK BY FALLING OBJECTS

The area under a tree being trimmed is a dangerous work zone, often called the landing zone or drop zone. Trees being trimmed or removed can become unstable even when the best techniques are used. Companies should have pre-planned procedures and communication in place to prevent workers from entering the work zone while tree removal or trimming is being done.

Incident *A tree-trimming company was on-site in the backyard of a private home to take down large trees. While the ground crew was on a break, the crew leader worked in an elevated aerial lift, cutting branches off an 80-foot tree. Although he had been told to stay out of the work zone, a groundman walked under the tree, unknown to the crew leader in the lift. A 50-pound tree branch fell on the groundman.*

PREVENTION

Currently, there is no restriction on anyone establishing a tree-trimming business in New Jersey. Some arborists support state licensure to ensure conformity of practice and assurance of minimal standards of practice. Professional arboricultural

associations have developed specific training and practice standards in order to prevent injuries. Anyone planning to do tree work should become educated on safe tree trimming and removal procedures, including the American National Standards Institute and Occupational Safety and Health Administration (OSHA) regulations. OSHA and the National Arborist Association have formed an alliance to promote safer and more healthful working conditions for workers in the tree service industry.²

When estimating a job, the arborist should inspect each tree, from its roots to its branches, looking at the health of the tree and any structural weakness or defects. The tree's environment should be evaluated, looking for electrical wires and other hazards in the area. The inspection is the basis for planning how the tree will be removed or trimmed, what equipment will be needed to do the job safely, and what personal protection is required. If several workers will be on the job, work should begin only after the



Even if this worker is wearing fall protection equipment, he still can be fatally injured if the power lines in his proximity are not de-energized.

arborist has held a job briefing and has instructed workers about hazards, equipment, and methods to be used to safely perform their tasks.

The New Jersey High-Voltage Proximity Act (N.J.S.A. 34:6-47.1 et seq.) and Regulations (N.J.A.C. 12:186) describes precautions to be taken in the proximity of high-voltage lines for the prevention of electrocutions. For more information, please contact the New Jersey Department of Labor, Safety Compliance Unit at (609) 292-2096 or via e-mail at hblack@dol.state.nj.us.

RESOURCES

Standards

American National Standards Institute, Z133.1 Revision – October 2000. American National Standards for Tree Care Operations – Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and Cutting Brush – Safety Requirements.

Professional Organizations

Tree Care Industry Association,

formerly National Arborist
Association – 3 Perimeter Road -
Unit 1, Manchester, NH 03103
Phone 1-800-733-2622 or
(603) 314-5380

Committee for the Advancement
of Arboriculture (CAA) –
370 East Veterans Highway
Jackson, NJ 08527
Phone (732) 833-0325

International Society of Arbori-
culture and its professional
affiliate, Society of Commercial
Arboriculture – P.O. Box 3129,
Champaign, IL 61826-3129
Phone (217) 355-9411

Internet Resources

Information and publications on
safety and health standards can be
obtained from the Internet. Some
useful Web sites include:

www.natlarb.com – The Tree
Care Industry Association and the
National Arborist Association
www.isa-arbor.com – The Inter-
national Society of Arboriculture
www.aces.uiuc.edu/isa-sca/ – The
Society of Commercial Arbori-
culture

www.osha.gov – The US Depart-
ment of Labor, Occupational
Safety and Health Administration
(OSHA)

www.cdc.gov/niosh/ – Centers for
Disease Control and Prevention/
National Institute for Occupa-
tional Safety and Health (CDC/
NIOSH)

[www.state.nj.us/health/eoh/
peoshweb](http://www.state.nj.us/health/eoh/peoshweb) – DHSS Public
Employees Occupational Safety
and Health (PEOSH) Program
[www.state.nj.us/labor/lssse/
lshgvolt.html](http://www.state.nj.us/labor/lssse/lshgvolt.html) – NJDOL Safety
Compliance Unit

References

1. U.S. Department of Labor, Bureau of
Labor Statistics.
2. OSHA news release, February 27,
2003.

Q&A Fall Arrest Equipment - What Is it All About?

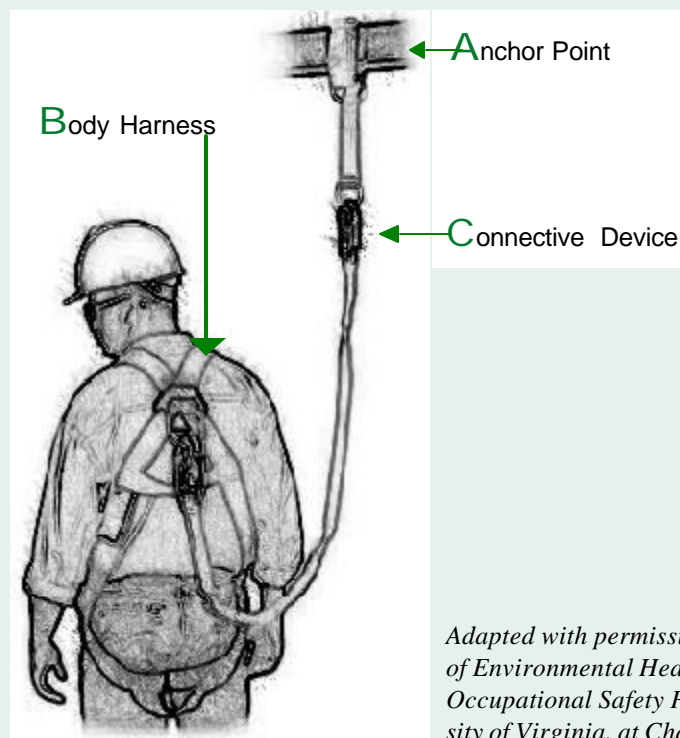
Fall arrest equipment is designed to significantly limit injuries in the event of a fall. It is very important that the equipment is selected and worn correctly; someone's very life could be "hanging on the line!" So, what are the key components of fall arrest equipment? A simple rule to follow when working six feet above the ground is the A-B-C rule.

A stands for Anchor Point. Something has to keep you safely suspended in the air! Federal law requires an Anchor Point that is structurally sound, i.e, good for a static force of 5,000 lbs. Some options include permanent or reusable anchors that can be attached to roof decks or steel beams.

B stands for Body Harness. The harness straps around your chest, buttocks and thighs. Newer fabrics make the webbing stretchable, providing for a more comfortable fit. In the event of a fall, you would be suspended upright and intact (with some gray hairs of course)!

C stands for Connecting Device. This connects the Body Harness to the Anchor Point. Generally these are referred to as Shock Absorbing Lanyards, or Self Retractable Lifelines. A very important part of the Connecting Device is the locking snap hook. Locking snap hooks are required by Federal law to prevent "roll out." Roll out has resulted in fatalities when the snap hook has become disengaged from the Anchor Point.

Remember the **ABCs**. It's a matter of life!



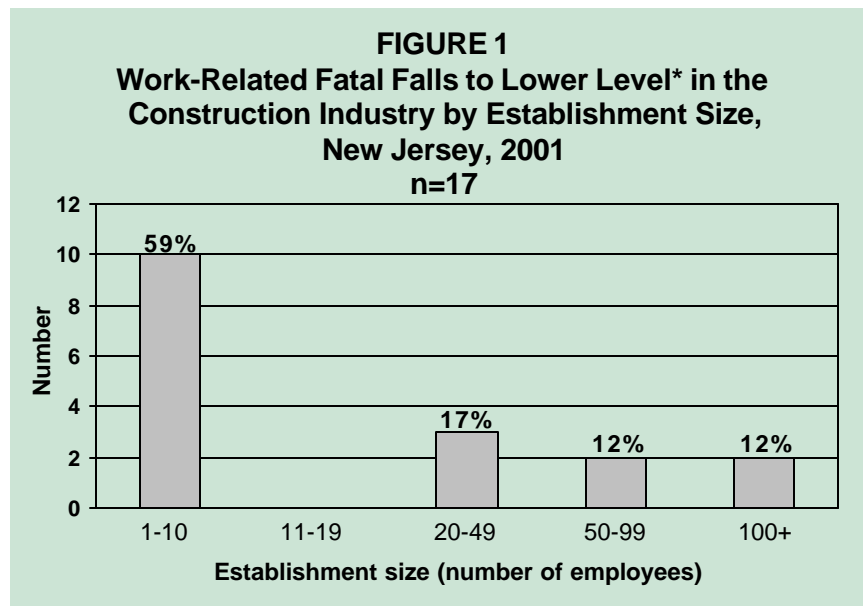
*Adapted with permission from the Office
of Environmental Health and Safety,
Occupational Safety Program, Univer-
sity of Virginia, at Charlottesville, VA.*

FATAL FALLS

Continued from page 1

comprehensive, accurate, and timely measure of all work-related fatalities in all 50 states. In 2001, there were 5,915 work-related fatalities in the United States. CFOI data shows falls were the leading cause of death in the construction industry. In 2001, there were 410 fatal falls to a lower level in the construction industry, up about 12 percent from 368 in 2000, and accounted for 59 percent of all work-related fatal falls to a lower level in all industries. Overall, deaths from falls to a lower level on the job were also the highest recorded at 698 in 2001, a 13 percent increase over the 2000 level.

Table 1 provides information on fatal falls that occurred in New Jersey from 1992 to 2001. During this 10-year period, the proportion of fatal injuries in the construction industry caused by falls averaged 44 % while the proportion of fatal falls in all industries was only 15%. In 2001, of the 22 workers who died



of injuries sustained in falls, 17 (77%) worked in construction occupations. The following describes the characteristics of these 17 fatal injuries. All of the victims were male. Age at death ranged from 17 to 69 years old; the average age was 39. Seven (41%) were foreign-born. Eleven were white, non-Hispanic; three were black, non-Hispanic; and three were Hispanic or Latino. All but one

incident occurred at a construction site. Twelve incidents occurred at general construction sites and four occurred at residential construction sites. As shown in Figure 1, the majority (59%) of the 17 companies employed fewer than 11 employees. Information on 16 of the 17 individuals who died showed that these workers fell an average distance of 34 feet. The shortest distance was 10 feet and the longest

TABLE 1
Fatal Falls to Lower Level* in New Jersey – 1992 to 2001

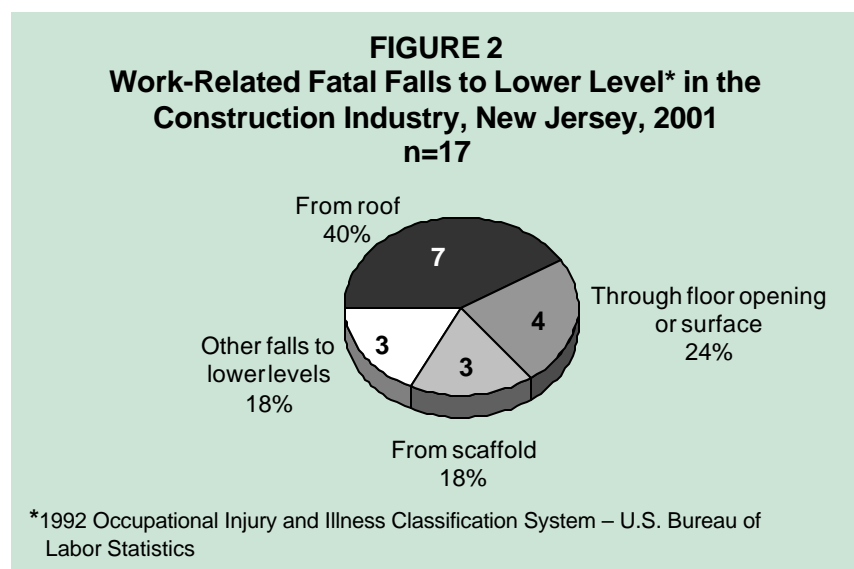
Year	All Industries			Construction Industry		
	Total Fatal Injuries in All Industries	Fatal Falls to Lower Level	Percent of All Industries	Total Fatal Injuries in Construction	Fatal Falls to Lower Level	Percent of Construction Industry
1992	138	17	12 %	30	9	30 %
1993	145	27	19 %	34	17	50 %
1994	114	13	11 %	23	6	26 %
1995	118	13	11 %	19	9	47 %
1996	100	7	7 %	18	3	17 %
1997	101	16	16 %	27	14	52 %
1998	103	14	14 %	24	14	58 %
1999	104	21	20 %	26	14	58 %
2000	115	22	19 %	26	12	46 %
2001	129	22	17 %	32	17	53 %
TOTAL	1,167	172	15 %	259	115	44 %

*Includes fatalities to workers employed by governmental organizations regardless of industry.
SOURCE: Bureau of Labor Statistics, U.S. Department of Labor.

distance was 100 feet. Figure 2 describes the manner in which the incident occurred. The most common type of fall to lower level in construction was fall from a roof (7). There were four falls through a floor opening or through a floor surface, three falls from scaffolds or staging, and three other types of falls to lower level.

The Occupational Safety and Health Administration (OSHA) has established and is enforcing the Fall Protection standard in construction workplaces (*Title 29, Code of Federal Regulations*, Subpart M, Fall Protection, 29 CFR 1926.500(a), 1926.501, 1926.502, and 1926.503). OSHA issued citations to ten of the 17 employers (Table 2). OSHA did not issue any citations to three employers although an inspection was conducted because there was insufficient evidence of an OSHA violation. Three fatalities were not reported to OSHA and thus the work sites were not inspected. One company was outside of OSHA's jurisdiction.

According to OSHA data, events surrounding fatal falls often involve a number of factors, including unstable working surfaces, misuse of fall protection equipment, and human error.¹ As indicated by the issued citations listed in Table 2, these fatalities may have been prevented if workers were supervised and trained properly and practiced safe work procedures as outlined in the OSHA Fall Protection standard in construction. Employers should train workers in the proper selection, use, and maintenance of fall protection systems. OSHA standards require the use of fall protection when working above 6 feet, in most cases. Some types of protection include:



lifelines, safety belts, and lanyards secured to the worker and to a structural part of the building; scaffolds with guardrails; and safety nets rigged below the work area.

Any training conducted by employers in the types of fall protection systems must take into consideration the workers' level of fluency in the English language. As stated earlier, seven (41%) of the 17 workers fatally injured were foreign-born, and language may have been a factor. Language may also be an issue for contractors and owners who are foreign-born and have limited English language skills. An additional concern is the size of these companies since OSHA does not regularly inspect workplaces with fewer than 11 employees unless a fatality occurs or there is a complaint. Without regular inspections these small companies do not benefit from interaction with OSHA safety inspectors regarding fall-related hazards.

New Jersey is one of 16 states funded by the National Institute for Occupational Safety and Health (NIOSH) to participate in the Fatality Assessment and Control Evaluation (FACE) research project.

The DHSS FACE project investigates selected work-related fatal injuries that occur in New Jersey. The goal of the FACE project is to prevent injuries by identifying the risk factors that cause workplace fatalities and recommend ways to prevent future incidents. Posted on the NIOSH FACE Home Page (www.cdc.gov/niosh/face/faceweb.html) are FACE investigation reports published by the FACE states including New Jersey. The reports contain findings and recommendations regarding fatal injuries involving falls in all types of industries and contain no names or other identifiers.

The OSHA Web site, www.osha.gov, has numerous resources available on fall protection in the construction industry that can be useful to employers and workers. (See sidebar on page 10) Information can also be obtained by calling a local OSHA area office. Another important resource is OSHA Consultation Services. In New Jersey, this free service is delivered on-site by the New Jersey Department of Labor (NJDOLE) and is completely separate from the OSHA inspection effort, i.e., no penalties are proposed or citations

TABLE 2
Type of Fall by Distance Fallen and Examples of Workplace Citations Issued by OSHA
Construction Industry, New Jersey, 2001

Type of Fall	Distance Fallen (feet)	Examples of Workplace Citations Issued by OSHA
Through floor surfaces	30-40	<ul style="list-style-type: none"> ● Employees exposed to fall hazards of 20-30 feet were not protected from falling by the use of guardrail, safety net, or personal fall arrest systems. ● Temporary, outrigger scaffold being used for landing of materials and equipment was not erected, dismantled, and/or moved under the supervision of a qualified person. ● Tag lines or equivalent measures to control the loads being hoisted onto or near scaffolds were not used. ● Not preventing bundles of concrete forms from falling by securing or placing them away from the edge. ● Outrigger scaffold was not designed by a registered professional nor was it constructed and loaded in accordance with such design. ● Employee was not properly trained to work on scaffolds.
From roof edge	36	<ul style="list-style-type: none"> ● Safety nets were not provided.
Through existing floor opening	20	<ul style="list-style-type: none"> ● A safety and health program was not initiated and/or maintained. ● Employer did not instruct employees in the recognition and avoidance of unsafe conditions. ● Employer did not train employees in the safe erection of scaffolds. ● Employer did not provide ladder safety training to employees. ● Employer did not remove construction debris at regular intervals. ● Employees were working on scaffold board less than 18 inches wide. ● No fall protection was provided. ● Floor holes were not covered. ● No guardrails for wall openings were provided. ● Job-made ladders were less than 16" wide and ladder steps were less than 10" apart. ● Portable job-made ladders did not extend at least 3 feet above upper landing.
From ladder	30	<ul style="list-style-type: none"> ● Ladder was placed on a concrete floor and was not equipped with non-slip feet nor was a barricade used to prevent displacement. ● Ladder was not lashed, held in position, or placed to prevent slipping.
Through existing floor opening	10	<ul style="list-style-type: none"> ● No guardrails installed around the perimeter of the hole in the floor. ● Ladder was not secured against displacement. ● Notification of the incident was not made to OSHA within 8 hours.
From building girder	12	<ul style="list-style-type: none"> ● Employer did not maintain a log of all recordable occupational injuries and illnesses (OSHA Form 300).
From scaffold staging	100	<ul style="list-style-type: none"> ● Scaffold exceeded the maximum intended load. ● Employers did not have employees trained by a qualified person about the hazards of overloading a scaffold.
Through existing floor opening	35	<ul style="list-style-type: none"> ● No accident prevention program in place. ● No safety-related training was provided. ● No fall protection system was provided. ● No fall protection training was provided. ● Employer did not provide a safe means of assessing the work areas. ● Notification of the incident was not made to OSHA within 8 hours.
Through unguarded skylight	20	<ul style="list-style-type: none"> ● Employees working above 6 feet or more were not protected from falling by the use of guardrail systems or personal fall arrest system. ● No fall protection training was provided. ● Notification of the incident was not made to OSHA within 8 hours.
From roof edge	48-50	<ul style="list-style-type: none"> ● No accident prevention program in place. ● No fall protection training was provided. ● Employees were not provided with fall protection thereby exposing them to a fall of approximately 48-50 feet to the ground below. ● Portable metal ladder ~ 12 feet long was not secured to the roof to prevent slipping. ● Portable metal ladder ~ 12 feet long bent with missing rungs was not removed from service.

issued for any health and safety problems identified by the consultants. Under the Small Business Focus initiative, companies with 50 or fewer employees receive special priority in scheduling consultations. For more information, please contact the NJDOL On-Site Consultation Program at (609) 292-3923 or visit their Web site at www.state.nj.us/labor/lsse/lsonsite.html.

OSHA is forming partnerships with various stakeholders to address some of the most critical occupational safety and health issues. For example, it has recently formed alliances with the Construction Management Association of America and Independent Electrical Contractors, Inc. to share their collective expertise to help prevent injuries and illnesses in

construction workplaces. In New Jersey, FACE and the Center to Protect Workers' Rights are planning to conduct a joint project aimed at preventing falls from ladders in the construction industry (see "Current Issues" on pages 14-15 for more details). This article reiterates the need for employers to understand and comply with the OSHA Fall Protection standard in construction particularly in small construction companies. While fatalities draw the most attention, there are many more workers who suffer from fall-related injuries that lead to temporary or permanent disability.

Reference

1. U.S. Department of Labor, Occupational Safety and Health Administration Internet Web site. Safety and Health Topics: Construction - Fall Protection.

Fall Protection Resources from www.osha.gov

The following commonly asked questions link to resources that provide useful safety and health information about Fall Protection:

- **Where can I find information about fall protection?**
www.osha.gov/SLTC/constructionfallprotection/index.html#Recognition
- **Where can I find information to help me control exposure to falls?**
www.osha.gov/SLTC/constructionfallprotection/index.html#Control
- **Where can I find compliance information, including regulations and standards?**
www.osha.gov/SLTC/constructionfallprotection/index.html#Compliance
- **Where can I find information about training courses related to fall protection?**
www.osha.gov/SLTC/constructionfallprotection/index.html#Training
- **Where can I find additional information about fall protection?**
www.osha.gov/SLTC/constructionfallprotection/index.html#Other

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www.state.nj.us/health/eoh/survweb

The Occupational Health Surveillance Program Home Page

...describes surveillance activities for:

- fatal occupational injuries
- heavy metals
- silicosis
- occupational asthma
- initiatives for prevention of latex allergy

... summarizes occupational disease reporting requirements for:

- hospitals
- clinical laboratories
- physicians

... lists our publications (most are available online):

- reporting forms in electronic format
- educational materials
- industrial hygiene fact sheets
- FACE* investigation reports
- FACE Facts and Hazard Alerts
- list of articles published in peer-reviewed journals
- special surveillance reports

... and provides links to related sites.

*FACE (Fatality Assessment and Control Evaluation)

ANTHRAX ATTACK

Continued from page 1

agency effort to characterize the extent and magnitude of spore contamination, to remediate the contamination in the Trenton PDC, and to ensure the safety of workers and the community during the process.

The Trenton PDC has been closed for over two years and is now only entered by specially-trained workers who are outfitted with respirators and protective garments, and who are thoroughly decontaminated upon exit. The USPS has retained contractors to undertake the task of decontaminating the building interior and rendering it safe for postal employees and the public to once again conduct the business of delivering mail. An alphabet soup of government agencies is involved in the project: EPA, OSHA, CDC, NIOSH, AFFRI, NJDEP, NIST, USAMRIID, FBI, and many more. Among the divisions of the DHSS who have devoted their resources to working on this effort are the Division of Public Health and Environmental Laboratories (PHEL) and the Division of Epidemiology, Environmental and Occupational Health, wherein resides the Occupational Health Service.

The Occupational Health Service of the DHSS is staffed with industrial hygienists who are trained and experienced in the recognition, evaluation, and control of work-related health hazards, including physical conditions, chemicals, and biological agents. Investigators from the FBI determined that letters containing *B. anthracis* (anthrax) spores had been processed at the Trenton PDC in New Jersey. DHSS industrial hygienists were called

upon to assist in the initial characterization of contamination within the facility.¹ Other agencies responding to the immediate need for expert assistance included the DHSS Consumer and Environmental Health Services, the New Jersey Department of Environmental Protection, and the Hamilton Township HazMat Team.

The approach taken to initially characterize the magnitude and extent of spore contamination in the Trenton PDC was to use USPS and FBI information describing the path of the letters through the processing areas. This led investigators to initially focus on the areas most likely to be contaminated by anthrax spores, as well as areas normally accessed by the public, such as sales counters and stamp machines. Samples for spores were collected using methods that have previously been employed to evaluate contamination by similar biological agents. Sample results showed that the letter path was significantly contaminated with viable spores. Fortunately, the public access areas were found not to be contaminated. Subsequent sampling for spores was performed in phases, in such a manner as to gradually expand the perimeter of the characterized area. Complex mail sorting machines, work stations, floors, walls, ceilings, rafters, ventilation system components, and miscellaneous sites were sampled using swabs, gauze pads, and vacuum-filter socks. Samples were analyzed by the DHSS PHEL. Within three weeks, public health officials realized that aerosolization and cross-contamination had resulted in the spreading of spores throughout the work areas of the building, and that the facility was extremely contaminated. Subsequent testing by the USPS contractors over the

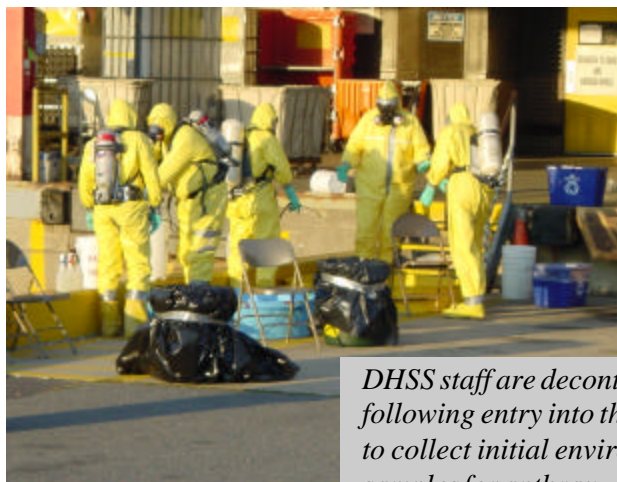
next year confirmed these findings. It became clear that the building would ultimately have to be decontaminated by some method of fumigation.

While research was conducted on the most appropriate method of fumigation, the principal contractor, working under the direction of the USPS, moved quickly to seal the building to prevent the release of spores into the surrounding environment. Contamination reduction zones were set up to control the insertion and removal of personnel and equipment. A multi-disciplinary team of CDC scientists was dispatched to the DHSS to assist the State Epidemiologist in the coordination and direction of immediate and projected public health response activities. Postal employees and other potentially affected individuals who routinely visited the facility were offered post-exposure antibiotic medication as a precaution against contracting anthrax. Tents and temporary facilities were set up in the parking lot to enable the continuation of Trenton PDC functions until workers were relocated to surrounding postal facilities. The USPS concurrently began directing a massive effort to clean the building.

A plan was developed to prepare the Trenton PDC for fumigation using chlorine dioxide, a gaseous chemical sterilant commonly used in industrial and commercial applications to disinfect water, food, and medical wastes. But before fumigation could take place, a myriad of tasks had to be completed. All items within the building were considered contaminated with anthrax spores, and had to be treated accordingly. Hundreds of thousands of pieces of mail remained in the

building, and it was a priority for the USPS to ensure that the mail was safely delivered. There also remained thousands of pieces of rolling stock and containers used to move mail throughout the processing areas and to other postal facilities. There were administrative files, computers, and personal items of all sorts. Inventories of all paper files, computer files, cash, stamps, and money orders had to be conducted prior to sterilization and removal. All porous materials inside the building, such as ceiling tiles and carpet, had to be decontaminated and removed. Spent personal protective equipment and decontamination water had to be disposed of safely. Sterilization of the mail was accomplished using electron beam irradiation, files and related paper items were irradiated with X-rays, and mail processing machinery and building surfaces were sanitized using a four-step process. This process entails the following steps: 1) removal of visible dust using a HEPA-filtered vacuum cleaner, 2) application of a 0.5% sodium hypochlorite (bleach) solution, adjusted to a pH of 7.0, for a minimum contact time of 60 minutes, 3) neutralization of the bleach using a sodium thiosulfate solution, and 4) water rinse and air dry.

Successful fumigation by chlorine dioxide requires that several parameters be met. The concentration of chlorine dioxide must be maintained at a level of 750 ppm for at least 12 hours, while temperature and humidity levels are kept at no less than 75°F and 75% relative humidity, respectively. The gas, temperature, and relative humidity levels must be distributed and maintained at the necessary levels in every nook and cranny of the building. Then the chlorine



DHSS staff are decontaminated following entry into the Trenton PDC to collect initial environmental samples for anthrax.

dioxide gas must be safely removed from the building.

A complex system of chlorine dioxide generators, piping, air movers, and scrubbers with filters has been constructed on site to safely deliver the gas into the building and then remove it from the exhausted air stream. Monitoring instruments linked to a sophisticated computer interface system were installed to monitor chlorine dioxide levels inside the building, at the scrubber system exhaust, and throughout the surrounding community.

In late October of 2003, the fumigation of the Trenton PDC was conducted. All target parameters were met and the process was deemed successful. A team of emergency response experts, as well as staff from the Occupational Health Surveillance Program, monitored the entire fumigation process and were prepared to react to any unplanned event or emergency.

A months-long post-fumigation sampling project is planned in order to ascertain the effectiveness of the fumigation process and determine whether the building is safe for reentry by unprotected contractors, postal employees, and the general public. Thousands of spore strips

and environmental samples will be analyzed to ensure that there are no viable *B. anthracis* spores remaining in the facility. Staff of the Surveillance Program are represented on the Environmental Clearance Committee, an independent group of scientists, chaired by the State Epidemiologist, who will review all data and make recommendations to the USPS regarding the effectiveness of the fumigation and whether the building is safe for reoccupancy. The building will then be refurbished and equipment will be removed or repaired to return the facility to its condition prior to processing the anthrax-contaminated letters.

In total, there were 11 cases of cutaneous anthrax and 11 cases of inhalational anthrax nationally, resulting in five deaths. Postal employees have expressed a mixture of anxiety and enthusiasm at the prospect of once again reentering the building to continue with the work they had been doing in October of 2001 when the facility was suddenly closed following the attack. Thanks to the combined efforts of the USPS, private contractors, and federal and state agencies, the Trenton PDC will again be open for business no sooner than the Fall of 2004.

1. Valiante DJ, Schill DP, Bresnitz, EA, et al. Responding to a Bioterrorist Attack: Environmental Investigation of Anthrax in New Jersey. *Appl Occ Env Hyg* 2003;18:780-785.

PREVENTING OCCUPATIONAL DISEASE

Continued from page 2

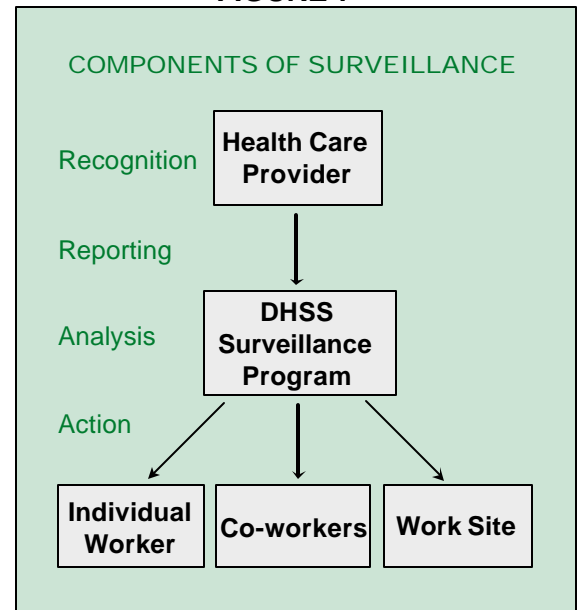
(medical examiner reports, hospital discharge data) ultimately rely on a physician's diagnosis of a given condition. More importantly, a physician's recognition/diagnosis of an occupational illness and injury provides an "early warning" that an Occupational Sentinel Health Event (SHE(O)) has occurred. A SHE(O) is a disease, impairment, or untimely death, which is occupationally-related and whose occurrence may: (1) provide the impetus for epidemiologic or industrial hygiene studies; or (2) serve as a warning signal that material substitution, engineering control, personal protection, or medical care may be required.¹ For these reasons, case reporting by clinicians is an important surveillance activity that facilitates the timely identification of worksites with potentially hazardous exposures.² Clinicians can play an important role in improving the recognition of occupational disease. This role can be maximized if clinicians increase their level of suspicion for workplace disease, and develop skills in taking occupational histories.³

Figure 1 illustrates the key components of the surveillance paradigm adopted by the DHSS and other States in the prevention of occupational disease and injury. Each component is often hindered by deficiencies. Underreporting by physicians as demonstrated in the case study described on page 2 continues to be a major limitation in disease surveillance systems throughout the United States.^{4,5} While clinicians are familiar with the existence of reporting requirements for infectious diseases, they have paid less attention to the recognition and reporting of occupational diseases and injuries although such mandates exist in more than 30

states, including New Jersey. Many clinicians are not aware of the various occupational diseases reporting requirements, some are unaware that they have to report or do not know the procedures, and, in addition, company-employed doctors may be hesitant to report outside of the company. Diagnosing a work-related illness can be difficult for most clinicians with limited training in occupational health.⁶ Long latency periods can make uncertain the association between an occupational exposure and a diagnosed illness. An occupational exposure may be one component among many factors in the etiology of a diagnosed condition. Finally, once an occupational disease is diagnosed, there are disincentives to report it, including health care professionals' concerns about becoming involved in litigation and about preserving employee confidentiality.⁷

The prevention of occupational illnesses and injuries is a challenging goal for public health professionals in New Jersey. The DHSS hopes to meet this challenge with the support of the New Jersey medical community and other stakeholders. In 2002, the Department received federal funding from CDC/NIOSH to support surveillance of occupational asthma and silicosis. A key component of this cooperative agreement is to utilize the occupational health medical network in New Jersey to improve recognition, reporting, and medical surveillance of these diseases (see "Current Issues" on pages 14-15 for more details). Detailed information

FIGURE 1



on the newly revised physician reporting requirements and reporting form are available on the DHSS Web site at www.state.nj.us/health/eoh/survweb or by calling the Occupational Health Surveillance Program at (609) 984-1863.

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Current Issues

SURVEILLANCE ...

Phase I of the **New Jersey Silica Partnership** showed that New Jersey highway workers are over-exposed to crystalline silica, putting them at risk of developing silicosis (*Am J Public Health* article in print in January 2004; *Occupational Health Surveillance Update*/February 2001). In Phase II, DHSS industrial hygienists have been working with NIOSH and other members of the Partnership to evaluate the performance and refine the design of a dust control for jackhammers that was invented by one of the member contractors. The method uses a fine mist of water to control dust generated by the jackhammer's chisel. Testing has shown that this control reduces dust exposure by as much as 90%, exceeding exposure reductions of other available ventilation/dust collection methods. Moreover, this innovative control has received positive reviews by contractors citing its cost, effectiveness, and feasibility over all other existing control measures. A patent has been applied for and it is hoped that the spray method will become a component of all new jackhammers and be retrofitted on existing jackhammers.

WORKPLACE VIOLENCE IN HOSPITALS

The DHSS Occupational Health Surveillance Program is participating in a research study of hospital violence events occurring in general and behavioral health hospitals in New Jersey and California. The primary purpose of this grant is to evaluate the simultaneous effects of two initiatives in California to decrease workplace violence in health care facilities. Using a bicoastal approach, the study will look at insititutions in New Jersey and California. New Jersey hospitals will serve as the controls for the study. At least 150 California hospitals and 50 New Jersey hospitals will be sampled using a stratified random sampling method to represent urban influence and hospital size. A comprehensive evaluation of security programs will be conducted through the review of safety program material and interviews with nurse managers, two staff members within the emergency department and behavioral health units, and the director of security. Incidence rates of violent events in participating facilities will be the primary outcome measure. An interrupted time-series analysis will be used to determine if the initiatives have led to decreases in rates when compared to the comparison (NJ) hospitals. The relationship between different components of the security programs and violent event rates will also be examined.

Silica Exposure in Dental Labs

Dental professionals are at risk for exposure to numerous biological, chemical, environmental, physical, and psychological workplace hazards. Dental laboratories manufacture dentures, crowns, bridges, and other prosthetic devices for dentists. Surveillance data have shown that dental lab technicians are involved in tasks that put them at special risk of developing silicosis.

DHSS developed a brochure titled "*What Dental Technicians Need to Know About Silicosis.*" The brochure, which is posted on the DHSS Web site (www.state.nj.us/health/eoh/survweb), describes the disease, sources of silica exposure, methods for controlling exposure to silica, and briefly summarizes other occupational health hazards found in dental laboratories.

NIOSH, in conjunction with the Occupational Health Service, conducted a mass mailing of the DHSS brochure to approximately 14,000 dental laboratories across the country under NIOSH letterhead.



PREVENTING INJURIES IN SANITATION WORKERS



Workers risk injury and death when riding on or working near refuse collection vehicles. Between 1990 and 2001, 24 workers were killed while working on or near sanitation trucks in New Jersey. Ten workers were killed by vehicles: six were run over by the sanitation truck while four were run over by a car. Ten workers died while riding on the riding step. Three workers were crushed to death between the truck and a dumpster. One driver was killed when his truck hit a car. In addition, there were many non-fatal injuries among sanitation workers.

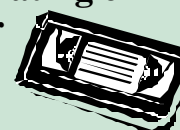
Based on these surveillance findings, DHSS developed a Hazard Alert aimed at sanitation workers. The pamphlet titled *“Don’t Get Hurt Working Around Sanitation Trucks”* offers simple steps to collectors and drivers to help prevent injuries while working on or near sanitation trucks. The information is written in clear and concise language and a Spanish version is available. DHSS conducted an outreach to New Jersey employers in the private and public sectors involved in refuse collection and posted the pamphlet on the DHSS Web site at www.state.nj.us/health/eoh/survweb. Over 1,000 employers were mailed packages consisting of a cover letter from the State Epidemiologist, the NIOSH Alert: *“Preventing Worker Injuries and Deaths from Moving Refuse Collection Vehicles,”* and the DHSS pamphlets in English and Spanish. For more information on workplace fatalities in New Jersey, see the 2001 CFOI annual report posted on the Web at www.state.nj.us/health/eoh/survweb.

New Jersey to Pilot CSTE* Occupational Health Indicators

New Jersey is one of eight states to pilot the 13 occupational health indicators and “how to guides” that have been developed by the CSTE* Occupational Health Surveillance Work Group and Core Surveillance States. These indicators provide rates on occupational illnesses and injuries within a State and can be used to promote program and policy development in worker safety and health at the national, state, and local level. The document is available online at the CSTE Web site. The direct link is www.cste.org/pdffiles/ohi2003.pdf.

* Council of State and Territorial Epidemiologists

NJ FACE/CPWR Collaborating on Ladder Safety Video



The New Jersey Fatality Assessment and Control Evaluation (FACE) project and the Center to Protect Workers’ Rights (CPWR) are collaborating on an outreach project targeting construction workers in an effort to prevent falls from ladders. A video with stories from disabled workers, surviving children of workers killed in falls, and coworkers who witnessed these fatalities will be produced to educate workers on the dangers of ladders will include tips on ladder safety. Falls are the leading cause of worker fatalities in the New Jersey construction industry.

New Jersey SENSOR Convenes Physician Outreach Advisory Group - The Occupational Health Surveillance Program was recently awarded a new 3-year grant under the NIOSH Sentinel Event Notification System for Occupational Risks (SENSOR) Program. Tracking occupational asthma and silicosis will be the primary focus of this SENSOR project. The project will also include the first time use of electronic workers’ compensation data and hospital emergency department data for disease tracking and follow-up. The project includes a partnership with the University of Medicine and Dentistry of New Jersey, Environmental and Occupational Health Sciences Institute (EOHSI) to develop strategies for improving physician recognition, diagnosis, and reporting of occupational diseases. A physician outreach advisory group has been formed and includes representatives from hospitals, academia, medical societies and associations, and the DHSS.

Occupational Illness and Injury Reporting to the New Jersey Department of Health & Senior Services

Condition	Number of New Individuals Reported ¹											Cumulative Total
	From beginning of reporting through 1992	'93	'94	'95	'96	'97	'98	'99	2000	2001	2002	
Fatal Injuries ²	1,243	145	114	118	99	101	103	103	115	129	129	2,399
Occupational asthma ³	256	70	41	57	39	72	22	9	8	5	6	585
Silicosis ⁴	930	46	26	25	47	43	40	34	30	33	20	1,274
Other pneumoconioses ⁵	4,729	624	474	655	611	498	417	1,609	1,581	1,746	1,424	14,368
Acute lung conditions ⁵	681	75	57	68	82	59	32	140	132	137	138	1,601
Chemical poisonings ⁵	1,909	207	141	216	150	129	145	289	204	246	226	3,862
Elevated blood lead levels ⁶	3,089	308	225	181	220	186	137	196	206	252	159	5,159
Elevated blood and urine mercury levels ⁶	374	17	24	23	34	11	35	20	33	36	30	637
Elevated blood and urine cadmium levels ⁶	246	16	14	30	17	18	16	9	24	6	9	405

¹ Includes confirmed and unconfirmed workers.

² Data sources: death certificates, medical examiners' reports, OSHA, workers' compensation reports, Fatal Accident Reports, news clippings. Reporting began in 1983.

³ Data sources: physicians, hospital reports. Reporting began in 1988.

⁴ Data sources: hospital reports, physician reports, death certificates. Reporting began in 1979. Incomplete reporting from hospitals in 1993 and 1994.

⁵ Data source: hospital reports. Reporting began in 1985. However, starting in 1999, reporting changed to electronic hospital discharge data; cases from previous years may be included.

⁶ Data sources: physicians, laboratory reports. Reporting began in 1985.

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